A1 cont.

6. (Amended) An apparatus as claimed in claim 4, wherein at least one corresponding photoconductor comprises a photoconductive diode including a modified electrode structure.

A2

11. (Amended) An apparatus as claimed in claim 5, wherein at least one corresponding shunt photoconductor comprises a photoconductive diode including a modified electrode structure.

A3

16. (Amended) An apparatus as claimed in claim 4, wherein at least one corresponding photoconductor comprises a photoconductively controlled channel transistor.

17. (Amended) An apparatus as claimed in claim 5, wherein at least one corresponding shunt photoconductor comprises a photoconductively controlled channel transistor.

A4

19. (Amended) An apparatus as claimed in claim 4, wherein each corresponding photoconductor can carry a current of at least 20 A for 50 ns.

REMARKS

The examiner has raised an objection to Fig. 6 as not being designated as prior art. Applicant submits that Fig. 6 is not prior art, but instead discloses a modified electrode structure of a conventional device. The examiner is directed to page 8, last two lines, which states: "As shown in Fig. 6, the modified electrode structure 52...." (emphasis added). Applicant notes that original Fig. 6 includes a label EG&G C30808E, which was intended to be directed to the underlying base diode upon which the modified electrode structure 52 is formed. The use of the

modified electrode structure 52, however, is not part of the prior art. Accordingly, Fig. 6 should not be labeled as prior art. A proposed drawing correction is enclosed herewith to include an arrow to the base diode associated with the label. Applicant will submit formal drawings incorporating the proposed drawing correction upon the approval of the examiner and the allowance of the claims in this case.

The examiner has raised minor objections to claims 4 and 19. Applicant notes that the examiner makes reference to "a photoconductor" in lines 3 and 1 of claim 4. The term "a photoconductor", however, only appears once in original claim 4 in line 3. Clarification of the objection regarding line 1 is respectfully requested. It is believe the amendment to claim 4 addresses the objection raised by the examiner. Claim 19 has also been amended in view of the examiner's comments.

Claims 4-17 and 19 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the invention. Applicant has amended the claim to make clear that each transistor within a leg is coupled to a corresponding photoconductor. Reconsideration and withdrawal of the amendment is respectfully requested.

Claims 1-3 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zucker et al. Zucker et al. is directed to an optically controlled thyristor. Applicant respectfully traverse the rejection.

The present invention is directed to providing isolation between a substantially benign environment in which sensitive electronic components are located, and a substantially harsh electronic environment in which electronically insensitive components (for example motors) are located. In the claimed invention, the sensitive components are isolated from the harsh environment by an optical cable. A key element of the invention is an optically driving power

circuit, wherein the power circuit can be directly driven by light passing through the optical cable. Accordingly, sensitive electronic components can be fully isolated from power components. The invention is particularly applicable in fly-by-wire systems, wherein semiconductor devices (for example microprocessor controllers) that are sensitive to electromagnetic interference (EMI) can be completely isolated from DC motors used to drive a aircraft control surfaces.

Zucker et al. does not disclose or suggest locating an optical triggering circuit in a benign electronic environment, while placing a power circuit that is driven by the optical triggering circuit in a harsh electronic environment. Instead, Zucker et al. is primarily directed to improvements in thyristor control. There is nothing in Zucker et al. to suggest that the lasers which drive the thyristor be placed separate therefrom in a benign electronic environment. Accordingly, the single Zucker et al. reference cannot be the basis for finding the claims prima facie obvious as required under 35 U.S.C. 103(a).

Claims 4-6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zucker et al. and Beeston et al., and claims 7-15 and 19 stand rejected as being unpatentable over Zucker et al., Beeston et al, and the admitted prior art. There is nothing in Beeston et al. or the admitted prior art, however, that overcomes the deficiencies of Zucker et al. discussed above. Accordingly, these claims are allowable for the same reasons set forth with respect to claim 1.

Applicant notes that claims 16 and 17 have not been rejected based on prior art. Accordingly, it is believed this claims should be indicated as allowed once the rejection under 35 U.S.C. § 112 is overcome.

The period for response having expired, applicant hereby petitions for a three month extension of time. The Commissioner is hereby authorized to charge the extension fee, along with any additional fees that may be required to maintain the pendency of this application, to Deposit Account 18-2056.

Respectfully submitted,

11/20/02
Date

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Registration No. 31,923

Attorney Docket: APTI:027

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AMENDED CLAIM APPENDIX

1. (Amended) An apparatus comprising:

an optical triggering circuit at a first location within a substantially benign electronic environment, wherein said optical triggering circuit generates an optical trigger signal;

a power circuit located at a second location remote from the first location within a substantially harsh electronic environment, wherein said power circuit includes [a] at least one photoconductor that is responsive to the optical trigger signal generated by the optical triggering circuit; and

an optical cable coupling the optical triggering circuit to the power circuit;

wherein the power circuit is directly driven by the transmission of the optical trigger signal from the optical triggering circuit to the power circuit via the optical cable.

2. (Amended) An apparatus as claimed in claim 1, further comprising a control processor coupled to the optical triggering circuit at the first location, wherein the optical triggering circuit is responsive to receipt of a command signal from the control processor to generate the optical trigger signal.

3. (Amended) An apparatus as claimed in claim 1, further comprising a DC motor coupled to an output of the power circuit at the second location.

4. (Amended) An apparatus as claimed in claim 1, wherein the power circuit includes at least one leg including a pair of transistors, each transistor including a base coupled in series to a corresponding photoconductor, wherein activation of the corresponding photoconductor turns on the transistor.

5. (Amended) An apparatus as claimed in claim 4, further comprising a corresponding shunt photoconductor coupled to the base of each transistor, wherein activation of the corresponding shunt photoconductor turns off the transistor.

6. (Amended) An apparatus as claimed in claim 4, wherein [the] at least one corresponding photoconductor comprises a photoconductive diode including a modified electrode structure.

11. (Amended) An apparatus as claimed in claim 5, wherein [the] at least one corresponding shunt photoconductor comprises a photoconductive diode including a modified electrode structure.

16. (Amended) An apparatus as claimed in claim 4, wherein [the] at least one corresponding photoconductor comprises a photoconductively controlled channel transistor.

17. (Amended) An apparatus as claimed in claim 5, wherein [the] at least one corresponding shunt photoconductor comprises a photoconductively controlled channel transistor.

19. (Amended) An apparatus as claimed in claim 4, wherein [the] each corresponding photoconductor can carry a [a] current of at least 20 A for 50 ns.

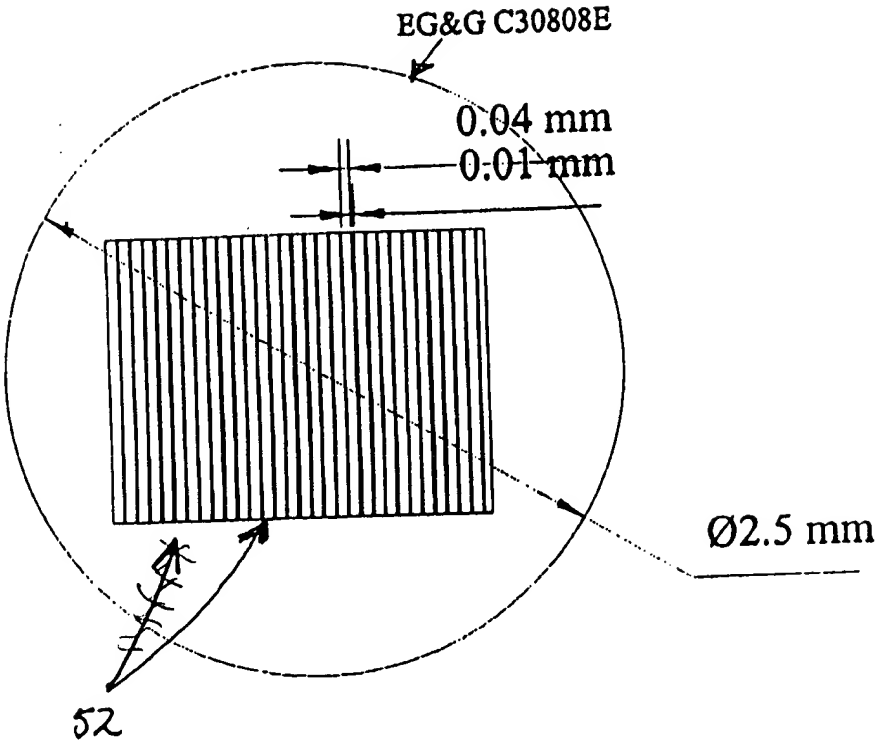
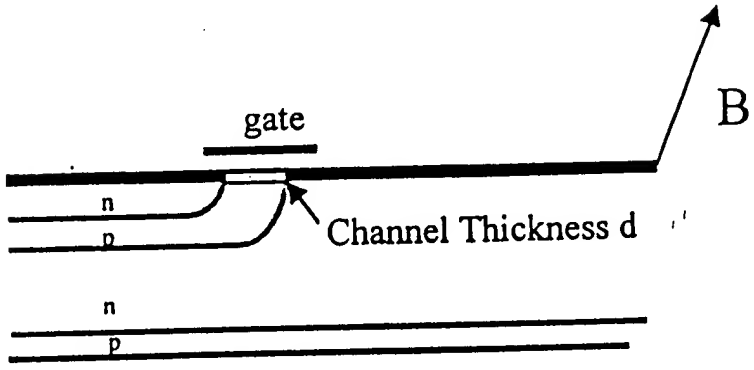


FIG. 6



$n\,d = \varepsilon_{ox} \bullet (E_{ox})/e \approx 10^{16} \bullet 10^{-4}$

@E=1.5MV/cm, epsilon=2

$\frac{I}{} = Jd = 0.3A/cm$ @ $V_d = 10^6$ cm/s

FIG. 7